

Listing of Claims

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted is in underline, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in double brackets [[]].

1. (Currently Amended) A fuel processing system, comprising:

a reforming region containing at least one reforming catalyst bed and adapted to receive a vaporized feed stream comprising water and methanol, wherein the at least one reforming catalyst bed is an air-permeable catalyst bed that does not require shielding or isolation from air to prevent air from contacting catalyst within the bed;

means for heating the reforming region to a temperature in the range of approximately 300-500° C;

a catalyst within the at least one reforming catalyst bed and adapted to catalyze the formation of a mixed gas stream comprising hydrogen gas and other gases by steam reforming of the feed stream, wherein the catalyst is non-pyrophoric, contains less than approximately 5 wt% copper oxide, is adapted to catalyze the formation of the mixed gas stream from the feed stream, and has an initial activity and a second activity after at least 1000 hours of use that is at least 75% of the initial activity; and

a separation region adapted to receive the mixed gas stream and to separate the mixed gas stream into a product hydrogen stream and a byproduct stream, wherein the product hydrogen stream has at least one of a greater concentration of hydrogen gas than the mixed gas stream and a reduced concentration of at least one component of the other gases

than the mixed gas stream, wherein the byproduct stream contains at least one of a lower concentration of hydrogen gas ~~then~~[[than]] the mixed gas stream and a greater concentration of at least one component of the other gases than the mixed gas stream.

2. (Original) The system of claim 1, wherein the catalyst contains less than 3 wt% copper oxide.

3. (Original) The system of claim 2, wherein the catalyst does not contain copper oxide.

4. (Original) The system of claim 1, wherein the catalyst contains active components of which zinc oxide forms a majority component.

5. (Withdrawn) The system of claim 4, wherein the catalyst further comprises chromium oxide.

6. (Withdrawn) The system of claim 4, wherein the catalyst further comprises calcium aluminate.

7. (Withdrawn) The system of claim 1, wherein the catalyst further comprises a high temperature methanol synthesis catalyst.

8. (Original) The system of claim 1, wherein the catalyst further comprises a high temperature shift catalyst that contains iron oxide.

9. (Original) The system of claim 1, wherein the catalyst is not adapted to produce methane during the production of the mixed gas stream.

10. (Original) The system of claim 1, wherein the catalyst is adapted to not be sintered during production of the mixed gas stream.

11. (Original) The system of claim 1, wherein after 2000 hours of use,

the second activity is at least 75% of the initial activity.

12. (Original) The system of claim 11, wherein after 5000 hours of use, the second activity is at least 75% of the initial activity.

13. (Cancelled)

14. (Original) The system of claim 1, wherein the separation region includes at least one hydrogen-selective membrane having a first surface that is exposed to the mixed gas stream, wherein the product hydrogen stream is formed from at least a portion of the mixed gas stream that permeates through the at least one hydrogen-selective membrane, and further wherein the byproduct stream is formed from at least a portion of the mixed gas stream that does not pass through the at least one hydrogen-selective membrane.

15. (Original) The system of claim 14, wherein the at least one hydrogen-selective membrane is formed from an alloy comprising palladium and copper.

16. (Original) The system of claim 1, wherein the separation region includes at least one pressure swing adsorption system adapted to receive under pressure the mixed gas stream.

17. (Withdrawn) The system of claim 1, wherein the separation region includes at least one methanation catalyst bed.

18. (Original) The system of claim 1, in combination with a fuel cell stack adapted to receive an oxidant stream and at least a portion of the product hydrogen stream and to produce an electric current therefrom.

19-41. (Cancelled)

42. (New) The system of claim 1, wherein the catalyst contains copper

oxide, but less than 5 wt% copper oxide.

43. (New) The system of claim 4, wherein the active components include at least 50 wt% zinc oxide.

44. (New) The system of claim 43, wherein the catalyst further comprises chromium oxide.

45. (New) The system of claim 43, wherein the catalyst further comprises calcium aluminate.

46. (New) The system of claim 43, wherein the catalyst further comprises a high temperature methanol synthesis catalyst.

47. (New) The system of claim 43, wherein the catalyst is not adapted to produce methane during the production of the mixed gas stream.

48. (New) The system of claim 43, wherein the catalyst is adapted to not be sintered during production of the mixed gas stream.

49. (New) The system of claim 4, wherein the active components include greater than 50 wt% zinc oxide.

50. (New) The system of claim 49, wherein the catalyst further comprises chromium oxide.

51. (New) The system of claim 49, wherein the catalyst further comprises calcium aluminate.

52. (New) The system of claim 49, wherein the catalyst further comprises a high temperature methanol synthesis catalyst.

53. (New) The system of claim 49, wherein the catalyst is not adapted to

produce methane during the production of the mixed gas stream.

54. (New) The system of claim 49, wherein the catalyst is adapted to not be sintered during production of the mixed gas stream.